Electric Drive Vehicles



What is an electric drive vehicle?
An electric drive vehicle uses electricity to help propel it. Electric drive vehicles include battery electric, fuel cell, and hybrid vehicles that use an electric motor to provide assistance to the engine or to propel the vehicle in low speed conditions when the engine is least efficient.

What is a battery electric vehicle?
A battery electric vehicle uses chemical batteries to power an electric motor. Battery electric vehicles have no internal combustion engine, use no "fuel" other than electricity, and produce no tailpipe emissions. They can have a range of up to 100 miles between charges.

Battery electric vehicles include:

- Neighborhood electric vehicles – vehicles with a top speed of 25 miles per hour
- City electric vehicles – small, maneuverable vehicles
- City shuttles
- City or school buses
- Airport ground support equipment and forklifts

Battery Electric Vehicle
Photo courtesy of Global Electric Motorcars, LLC

In addition to having no tailpipe emissions, electric vehicles have other advantages:

- HOV lane access on highways
- Free parking is provided in some areas
- Federal tax credits
- Recharging at home or work

What is a fuel cell vehicle?
A fuel cell vehicle obtains electrical energy from a fuel cell instead of a chemical battery to power an electric motor. There are different kinds of fuel cells such as molten carbonate, solid oxide, direct methanol, and proton exchange membrane fuel cells. Auto manufacturers prefer fuel cells that use a proton exchange membrane or PEM. The PEM fuel cell uses hydrogen to produce an electrical current to run the car's motor. The only exhaust from the vehicle is water.

The California Energy Commission is a member of the California Fuel Cell Partnership (CaFCP), a collaborative of auto manufacturers, energy companies, fuel cell technology companies, and government agencies. Since 2000, the CaFCP has tested and demonstrated 55 fuel cell vehicles throughout California. These vehicles have logged over 145,000 miles. Over the next four years, about 12,000 test riders will drive hydrogen fuel cell vehicles at 120 events.

Current fuel cell vehicles are gasoline models that have been redesigned by the auto manufacturers to include fuel cell components. The configuration of vehicles that will be produced for public sale is not known at this time.

Various Fuel Cell Vehicles
Photo courtesy of the California Fuel Cell Partnership

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What is a hybrid electric vehicle?
A hybrid electric vehicle uses both an electric motor and an internal combustion engine. The internal combustion engine and regenerative braking recharge the batteries for the electric motor. Fuel efficiency is the primary benefit of hybrid vehicles. There are two types of hybrids: parallel and series.

A parallel hybrid electric vehicle, such as the Toyota Prius uses the electric motor that's independent of the internal combustion engine.

Toyota Prius Hybrid Electric Vehicle
Photo courtesy of Toyota Motor Corporation

The Honda Civic Hybrid , a series hybrid electric vehicle, uses the electric motor to provide added power to the internal combustion engine.

Honda Civic Hybrid Electric Vehicle
Photo courtesy of Honda Motor Company

A variety of light-and heavy-duty hybrid electric vehicles are available to fleets and consumers today, with more models on the way. Some auto manufacturers claim that half of their new models within the next few years will be hybrid electric vehicles.

Currently, hybrid electric vehicles must be fueled at the pump with gasoline or diesel. Auto manufacturers are considering a hybrid electric vehicle that can also be plugged into electric outlets and recharged to minimize fuel combustion.

For more detailed information about battery electric, fuel cell, and hybrid electric vehicles, visit the following websites:

www.gemcar.com/
www.fuelcellpartnership.org/
www.eere.energy.gov/cleancities/afdc/altfuel/

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